



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re: Patent Application of John B. Davis et al.

Serial No. 08/373,953 filed January 17, 1995

Examiner R. Bonck, Art Unit 3502

For: Rotational Control Apparatus

PWN&K File 1084

Datruca Lewis
#13
Prior Art
7-15-96

INFORMATION DISCLOSURE STATEMENT

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Dear Sir:

In continuation of the AMENDMENT filed May 3, 1996, and as requested in the communication mailed January 31, 1996, the following is a concise explanation of the relevance of the previously cited documents which are not in the English language and which were not previously considered.

GERMANY 671285

This patent describes the way to incorporate the cooling fan with the holding brake so that the fan also cools the brake (and the motor). The fan is automatically engaged (and the brake disengaged) when the electrical field in the motor is established. Conversely the brake is engaged when the electrical field in the motor is disconnected.

GERMANY 1188191

This patent describes a way to vary the speed of a permanent magnet clutch or brake, be it a hysteresis or an eddy-current clutch or brake, without having to change the distance between the magnets and the ferromagnetic drive-plate. After a general description of a permanent magnet clutch or brake, the patent introduces the idea of a ring between the magnets and the drive-plate. This is further

elaborated upon by using a ring with a variable inner diameter (i.e., an "iris" or diaphragm-type apparatus). This ring can sit between the magnets and drive ring, in which case it must be made from an alloy with a high electrical resistance (to avoid warming up) like Fe-Si alloys, and the different parts can be plastic coated. The ring can also be attached to the magnets or the drive ring, in which case heating will not be a problem, but the mechanism to change the inner diameter will be more complicated.

GERMANY 1613060

This patent describes a way to cool an electrical motor like on washing machines that is used only intermittently (i.e., only driven for two seconds). The solution disclosed is using a separate rotor 6 and mounting the fan 8 on a bearing 7. The rotor still sits in the magnetic field of the stator 2. When the motor is engaged, the fan is basically a second small motor. Since it only sees a small load (the fan), it will accelerate very fast. This way, the fan will provide enough cooling, even if the main rotor 3 never reaches its normal speed.

GERMANY 2653459

This patent describes a way to allow the cooling fan of a rotating machine (an electrical motor) to turn at a different speed than the machine itself (higher or lower). This could be used on high-speed electrical motors (to limit noise from the cooling fan) or low-speed motors (to get sufficient cooling). Instead of mounting the fan 12 of Figure 1 immediately on the drive-shaft 4, it is now supported by a (needle) bearing 14 and driven by a planetary gear mechanism.

The invention also describes how this planetary gear drive can be incorporated into the main bearing 16, 17, 18 and 20 that supports the rotor of the machine. A second mechanism (Figure 3) uses a friction wheel 64 to come up with a different fan speed. Both mechanisms provide a fixed ratio between the fan speed and motor speed, so this invention is a mechanism for having the fan run at a different speed than the rotor.

GERMANY 2821973

This patent describes a permanent magnet clutch that combines a hysteresis drive and an eddy-current drive. The magnets 56 of Figure 1 made out of "rare earth elements" are mounted as shown in Figure 2 on a surface that has a low magnetic resistance (iron or steel) so that the magnetic loop can be closed. The hysteresis part is composed of the drive-ring 72 made out of a ferromagnetic substance (like Co-alloyed magnet-steel). The eddy-current element is a flat disc 74 which must be made out of a nonmagnetic substance with low resistance (Aluminum or Copper). Alternatively, the ring 72 could be plated with Copper or Aluminum, with a thickness of between 0.065 mm and 0.075 mm being suggested. All the other clutches mentioned in this patent work on a similar principle with some having radially mounted magnets.

GERMANY 3443523

This patent describes a two-step clutch, specifically intended for driving a cooling fan for an internal combustion engine. The two-step clutch has two parallel and separately usable electromagnetic clutch halves, which in turn, depending on cooling needed, designate one of the spools.

One of the clutch units is constructed as a friction clutch. The other clutch unit is an integrated eddy-current clutch of which the spool only is activated by the need for cooling, and which gives fan speeds well under the maximum fan speed, and mostly under 60% of the maximum fan speed. By this arrangement, the eddy-current unit can be kept small, and heat generation minimized. A sensitive adjustment of fan speed in the lower speed range is still possible and undesired shifting noises are mostly eliminated.

SWITZERLAND 390375

This patent describes a way to increase the speed of the fan on an electrical motor. Instead of fixing the fan on the motor shaft, the fan 4, 10 is mounted on a bearing 5. The fan is actually driven by its own electrical motor 6, 8. This motor is conceived so that it always runs faster than the main motor.

FRANCE 2355205

This patent describes a permanent magnet clutch. By changing the position of the rotating magnet 5, there is more or less coupling between the two halves of the coupling 13, 14. This will result in a variable ratio between input and output. The magnet is moved back and forth by the keyway 6 that sits in the control shaft 4 that sits inside the input shaft 3.

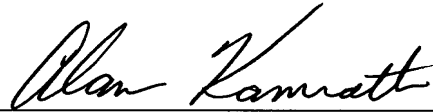
Consideration of the above patents is then respectfully requested. Towards that end, enclosed is a fresh PTO Form 1449 for the convenience of the United States Patent and Trademark Office.

Allowance of the above application is respectfully requested.

Respectfully submitted,

John B. Davis et al.

By



Alan D. Kamrath, for
Peterson, Wicks, Nemer
& Kamrath, P.A.
Attorneys for Applicants

Peterson, Wicks, Nemer
& Kamrath, P.A.
1407 Soo Line Building
Minneapolis, MN 55402
Telephone: (612) 339-8501
Facsimile: (612) 337-5265

1IDS1084.11-15

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on the date indicated below.

5-30-96

